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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,153	03/29/2004	Zheng-Hong Lu	14657	8479

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EXAMINER

FERGUSON, LAWRENCE D

ART UNIT	PAPER NUMBER
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1774

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/811,153

Applicant(s)

LU ET AL.

Examiner

Lawrence D. Ferguson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17-20, 22-26 and 30-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17-20, 22-26 and 30-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/9/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment mailed November 9, 2006.
Claims 15, 17-18, 22-23, 25-26, 38-39 were amended, claims 16, 21 and 27-29 were cancelled and claim 47-49 were added rendering claims 1-15, 17-20, 22-26 and 30-49 pending.

Claim Rejections – 35 USC 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 47-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 47, the phrase, "wherein said substrate is part of a device" is indefinite. Claim 10 does not disclose a substrate, which claim 47 relies on.

In claim 48, the phrase, "wherein said optoelectronic device" is indefinite. Neither claims 15, 41 or 42 disclose an optoelectronic device which claim 48 relies on. Correction is requested.

In claim 49, the phrase, "wherein said electronic device" is indefinite. Neither claims 15, 41 or 42 disclose an electronic device which claim 49 relies on. Correction is requested.

New Matter - 35 U.S.C. 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 15, 17-20, 22-26, 30-46 and 48-49 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 15, the phrase, 'first interfacial layer located between said layer of light emissive material and said electron transport material' and 'a second interfacial layer located between said electron transport layer and said second electrically conductive layer' is not supported by the specification. The specification does not support a second interfacial layer in the same structure with a first interfacial layer.

Objection to specification

6. The amendment filed November 9, 2006, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Applicants amended the specification at page 5, line 21, to include "a first interfacial layer located

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between said layer of light emissive material and said electron transport material for improving electrical contact between said layer of light emissive material and said layer of electron transport material and a second interfacial layer located between said electron transport layer and said second electrically conductive layer, said interfacial layer comprising a fluoride compound for providing an Ohmic contact between said cathode electrode layer and said fullerene layer. Applicants also amended the specification at page 6, line 9 to include "The interfacial layer may comprise a fluoride compound and may be an alkaline fluoride compound. The fluoride compound may be calcium fluoride (CaF_2). The amendment at page 6, line 14 was amended to "the first interfacial layer may be a lithium fluoride (LiF). The amendment at page 6, line 17, an amendment was made to "The first interfacial layer."

Obvious Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-47 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-34 of copending Application No. 11/260,469. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both include a layered structure including a fullerene layer, a layer comprising lithium fluoride and an electrically conductive layer. Although Application No. 11/260,469, does not explicitly teach the layered structure exhibiting Ohmic behavior, because Application No. 11/260,469 teaches a layered structure comprising the same layers, having the same function as the instantly claimed invention, it is inherent for the layers to exhibit Ohmic behavior.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Obvious Double Patenting

9. Claims 1-47 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-39 of copending Application No. 11/257,393. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both include a layered structure including a fullerene layer, a layer comprising lithium fluoride and an

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electrically conductive layer. Although Application No. 11/257,393, does not explicitly teach the layered structure exhibiting Ohmic behavior, because Application No. 11/257,393 teaches a layered structure comprising the same layers, having the same function as the instantly claimed invention, it is inherent for the layers to exhibit Ohmic behavior.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections – 35 USC § 103(a)

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-24, 26-31, 33-38 and 41-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czerw et al. (U.S. 6,833,201).

Czerw discloses an electroluminescent (EL) device comprising a layered structure including a substrate, fullerene layer (C₆₀) bonded with a polymeric material, LiF layer, having a thickness of 0.5nm and aluminum layer. Czerw further discloses an EL device comprising a substrate, anode electrode layer (electrically conductive), hole transport layer having a thickness of 80nm, buffer layer (first interfacial layer), light emissive material, electron transport layer, cathode electron layer (electrically

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conductive) on the electron transport layer and a sealant (interfacial layer) (column 6, lines 39-65; column 7, lines 14-33 and Figure 3) where the cathode layer comprising a low work function material LiAl (Figure 3). In claim 37, the phrase, "thickness selected to produce pre-selected optical interference to generate multiple colors, colors of desired wavelength, and optimum optical power output" constitutes a 'capable of' limitation and that such a recitation that an element is 'capable of' performing a function is not a positive limitation but only requires the ability to so perform. In claims 15 and 46 the phrases, "for providing an Ohmic contact" and "for applying a voltage across the anode electrode layer and the cathode electrode layer" are intended uses. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Because Czerw has a layered structure with equivalent materials as the claimed invention, it would have been obvious to one of ordinary skill in the art for the layered structure comprising fullerene, LiF and aluminum to exhibit Ohmic behavior across the layers. Although Czerw does not explicitly disclose the first interfacial layer is located between the light emissive material and electron transport material, it has been held that rearranging parts of layers of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claim Rejections – 35 USC § 103(a)

12. Claims 25 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czerw et al. (U.S. 6,833,201) in view of Hung et al (U.S. 6,069,442).

Czerw is relied upon for instant claims 1 and 15. Czerw does not explicitly teach a calcium fluoride compound or tris-(8-hydroxyquinoline)aluminum(Alq). Hung teaches an EL device comprising tris-(8-quinolinato)Aluminum (Alq) along with a fluoride layer which comprises either lithium fluoride or calcium fluoride (column 3, lines 42-50 and column 4, lines 25-35). Czerw and Hung are both directed to EL devices with layered materials. Therefore, it would have been obvious to one of ordinary skill in the art to include the tris-(8-quinolinato) Aluminum (Alq) and calcium fluoride in the EL device of Czerw to substantially lower the barrier height of the electron transport (column 4, lines 25-35).

Response to Arguments

13. Applicant's arguments to the provisional rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-34 of copending Application No. 11/260,469 have been considered but are unpersuasive. Applicant argues the claims of '469 are not patentably distinct from the present claims because in the present application the electron transport layer is comprised of fullerenes and in Application No. 11/260,469 a hole injection layer is comprised of fullerenes. Applicant argues claims 1 and 2 of copending Application Serial No. 11/260,469 recite subject matter patentably distinct from the present claims. Examiner is not persuaded

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by this argument because claim 19 of copending Application No. 11/260,469 states the electron transport layer of claim 1 includes fullerenes. Additionally, there is also no clear teaching away from the claimed structure by copending Application Serial No. 11/260,469, as the copending application does not exclude additional layers, including a hole injection layer.

The provisional rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-39 of copending Application No. 11/257,393 is maintained due to Applicant not arguing the obvious double patenting rejection.

Applicant's arguments to rejection made under 35 U.S.C. 103(a) as being unpatentable over Czerw et al. (U.S. 6,833,201) has been considered but is unpersuasive. Applicant argues Czerw does not disclose the structure exhibits ohmic behavior. Because Czerw has a layered structure with equivalent materials as the claimed invention, it would have been obvious to one of ordinary skill in the art for the layered structure comprising fullerene, LiF and aluminum to exhibit Ohmic behavior across the layers. Recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims. *General Electric v. Jewe Incandescent Lamp Co.*, 67 USPQ 155. *Titanium Metal Corp. v. Banner*, 227 USPQ 773. Applicant bears responsibility for proving that reference composition does not possess the characteristics recited in the claims. *In re Fitzgerald*, 205 USPQ 597, *In re Best*, 195 USPQ 430.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Czerw does not disclose a pure layer of fullerenes) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claim 1 states "a first layer comprising fullerenes" which means the PPV found in the layer are not excluded from the disclosure of the instantly claimed invention. The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003).

Applicant states the ohmic behavior exhibited by the structures recited in claims 1 and 10 had very surprising and unexpected results by pointing to page 11, lines 13-20. This limitation of the claim(s) offers no positive level of criticality to the layered structure, absent any showing of unexpected results. Examiner was not convinced that the disclosure on page 11, lines 13-20 or Figure 2 teach an unexpected result over Czerw. Applicant fails to disclose any criticality with respect to the recited "exhibiting ohmic behavior." Therefore, in the absence of any evidence to the contrary, because Czerw has a layered structure with equivalent materials as the claimed invention, it would have been obvious to one of ordinary skill in the art for the layered structure comprising fullerene, LiF and aluminum to exhibit Ohmic behavior across the layers. Applicant argues the claims of Czerw do not teach the thickness of the lithium

fluoride layer. Column 7, lines 29-31, teaches the lithium fluoride layer has a thickness of 0.5nm, which meets the limitation of claim 5.

Applicant argues Czerw does not disclose the same structure as in amended claim 15. Czerw discloses an EL device comprising a substrate, anode electrode layer (electrically conductive), hole transport layer having a thickness of 80nm, buffer layer (first interfacial layer), light emissive material, electron transport layer, cathode electron layer (electrically conductive) on the electron transport layer and a sealant (interfacial layer) (column 6, lines 39-65; column 7, lines 14-33 and Figure 3) where the cathode layer comprising a low work function material LiAl (Figure 3).

Applicant's arguments to rejection made under 35 U.S.C. 103(a) as being unpatentable over rejected under 35 U.S.C. 103(a) as being unpatentable over Czerw et al. (U.S. 6,833,201) in view of Hung et al (U.S. 6,069,442) have been considered but are unpersuasive. Applicant argues the combination of Czerw and Hung do not suggest the subject matter of claims 25 and 32. Examiner maintains Czerw does not explicitly teach a calcium fluoride compound or tris-(8-hydroxyquinoline)aluminum(Alq); however, Hung teaches an EL device comprising tris-(8-quinolinato)Aluminum (Alq) along with a fluoride layer which comprises either lithium fluoride or calcium fluoride (column 3, lines 42-50 and column 4, lines 25-35). Czerw and Hung are both directed to EL devices with layered materials. Therefore, it would have been obvious to one of ordinary skill in the art to include the tris-(8-quinolinato) Aluminum (Alq) and calcium fluoride in the EL device of Czerw to substantially lower the barrier height of the electron transport (column 4, lines 25-35).

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is 571-272-1522. The examiner can normally be reached on Monday through Friday 9:00 AM – 5:30PM.

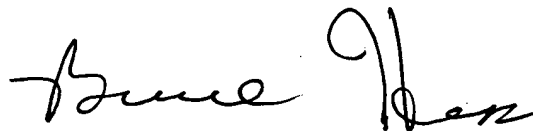
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye, can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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